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THE DISCOVERY REQUIREMENT IN MINING LAW, CAN IT BE SATISFIED BY GEOPHYSICAL DATA?

By CARL L. SANDSTROM*

On August 6, 1945, President Harry S. Truman, then returning to the United States from the Potsdam conference, electrified the world with the announcement that 16 hours earlier an atomic bomb had been dropped in Hiroshima, Japan. Since that date discoveries and developments in the field of nuclear science, together with the strained international situation created by the Cold War, have made the raw materials from which atomic energy is derived a vital national resource. As a result there has been an overwhelming increase in prospecting for these radioactive minerals.

History books, movies, and in more recent years, television, have done much to create an image of the prospector of the early West. The prospector of the uranium boom, however, differs considerably from his counterpart of the "good old days." The passage of time has brought improvements not only to his equipment but to his technique. The same cannot be said, however, for the statutes governing his prospecting activities. They have remained substantially unchanged and the courts have been faced with the task of fitting new techniques into a framework of old regulations. The resulting situation was aptly described by the Nevada Supreme Court when it stated:

> The problem is old in a new setting. The rush to a new strike and the scramble for the most desirable location. Today the magic word is uranium; the scintillator and the mineral lamp have taken the place of the prospector's tools; the airplane and the four-wheel drive truck have reduced factors of time and distance. The plot, the drama, however, remain essentially the same; the rush, the location, the overlapping of claims, the discovery of values, the dispute and in the orderly resolution of the dispute the principles of law remain unchanged from the days of the Mother Lode and Comstock.[1]

One of the essentials of this regulatory framework is a "discovery of valuable mineral" to establish a valid location on land of the public domain.[2] The discovery of mineral is the cornerstone of the location, the foundation of title, and no right exists until such discovery is made.[3] Although the statutes clearly state that discovery is required,[4] nowhere do they define the term nor state what is necessary to satisfy it. Thus, it has been left for the courts to decide what constitutes a "valid discovery." Though the problem has been treated in numerous cases, no very precise test had been laid down even before the development of radiometric prospecting devices.

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1 Berto v. Wilson, 74 Nev. 128, 324 P.2d 843 (1958).
2 Rev. Stat. § 2320 (1875), 30 U.S.C. § 23 (1952).
3 2 Lindley, *Mines*, § 335 (3d ed. 1914).
4 See note 2, *supra*.

The utilization of these newly developed instruments and techniques created additional problems and brought about an increased need for either a more exact test or standard to be used by the courts or a legislative revamping of the statutes governing this matter.

The fundamental issue in cases involving discovery of radioactive minerals has been the extent to which radiometric findings by Geiger counter, scintillator, or allied devices can be relied on by the locator. The purpose of this article is to examine the results of several recently decided cases and determine whether the courts in these cases have established a standard that can be used and relied on by persons locating claims for radioactive minerals.

I. The Discovery Requirement

The discovery requirement in mining law is a matter of basic policy and one that is firmly rooted in history. In all ages and all countries discovery has been regarded as conferring rights or claims as a reward.[5] The prospector went forth in search of minerals accompanied by a promise of reward. When a discovery was made the discoveror was granted the use of a segment of land and the right to remove minerals from that land. Discovery was the condition precedent to the reward.[6]

Prior to the enactment of the mining statutes by the United States, the rules and regulations of the California mining camps recognized discovery as essential to establishing a valid claim.[7] When the government acted to formalize the practices of the mining camps, a provision requiring discovery was included and basic mining law today contains the same provision: no location can exist until after discovery of mineral within the boundaries of the claim has occurred.[8]

The federal government, by this statutory framework regulating location, has established a method by which property rights, through a patent, can be acquired in a portion of the public domain. The purpose of such a plan is to facilitate the development of the natural resources of the nation. The function of discovery is to insure the government the benefit it seeks, i.e., development of its mineral wealth and at the same time discourage the bad faith locator. It is the good faith locator who has made a valid discovery of valuable mineral and who desires to further develop that discovery who will be rewarded and not the individual who, under the guise of a good faith locator, but with no discovery, attempts to obtain title to the land.[9]

That the law requires a discovery of valuable mineral for a valid location is clear. The reason or purpose for such a requirement is also clear. There is a lack of such clarity, however, when it comes to what constitutes a "valid discovery." Nowhere do the statutes define the term nor state what is required to satisfy it. Since ques-

5 See note 3, *supra*.

6 1 Lindley, *Mines*, 5-38 (3d ed. 1914).

7 O'Reilly v. Campbell, 116 U.S. 418 (1885); Jennison v. Kirk, 98 U.S. 453 (1878); Marshall v. Harvey Peak Tin Co., 1 S.D. 350, 47 N.W. 290 (1890); 1 Lindley, *Mines*, 43 (3d ed. 1914).

8 17 Stat. 91 (1872); 30 U.S.C. § 23 (1952). State statutes customarily contain the same requirement, e.g. Wyo. Stats. § 30-6 (1957).

9 Wasky v. Hammer, 223 U.S. 85 (1912); Shoshone Min. Co. v. Ritter, 87 Fed. 801 (9th Cir. 1898); Long v. Robinson, 148 Fed. 799 (9th Cir. 1906).

tions of discovery have been held to be questions of fact,[10] it has been left to the courts to determine from the evidence presented in each case whether the requirement has been met. Considerable litigation on this subject through the years has resulted in the evolution of the so-called "rule of discovery" which states: In order for a location to be valid there must be a discovery of mineral under such circumstances and of such character as would justify a person of ordinary prudence in the further expenditure of time and money with a reasonable prospect of success in developing a profitable mine.[11] Federal and state courts as well as the Department of Interior have accepted this as the general rule to be applied in determining the validity of a discovery.[12]

It can readily be seen that this rule is neither the epitome of exactness nor specificity. That courts have applied it with varying degrees of liberal or strict construction is not surprising. The result is widely varying pronouncements as to what evidence of discovery is sufficient to allow a prudent man the further expenditure of time and money to develop his claim. The Supreme Court in the *Chrisman* case[13] said that there must be "reasonable evidence of the fact either that there is a vein or lode carrying the precious mineral, or if it can be claimed as a placer that it is valuable for such mining." What constitutes "reasonable evidence" is a question of fact upon

10 United States v. Ohio Oil Co., 240 Fed. 996 (D. Wyo. 1916).
11 Cameron v. United States, 252 U.S. 450 (1920); Chrisman v. Miller, 197 U.S. 313 (1905).
12 Castle v. Womble, 19 L.D. 455; Jefferson v. Montana Copper Mines Co., 41 L.D. 320 (1912).
13 Chrisman v. Miller, see note 11 *supra*, at 323.

which equally learned courts and juries have reached conflicting conclusions.

What, then, will the courts accept as "reasonable evidence" of a valid discovery? As in certain other areas of the law a better idea of what will be accepted can be obtained by considering some of the evidences which the courts have in the past rejected. This is especially true when considering the problem of whether data obtained from geophysical instruments will be accepted as "reasonable evidence" to prove valid discovery of radioactive minerals. Certain of these holdings as to what does not constitute a valid discovery have mitigated against acceptance of geological and/or geophysical evidence as sufficient proof of the discovery of valuable mineral.

In *United States v. Iron and Silver Mining Co.*,[14] the United States Supreme Court, in 1888, rendered an important decision on this point. In that case the court commented as follows on the sufficiency of the discovery evidence there presented:

> It is not enough that there may have been some indication by outcroppings on the surface, of the existence of lodes or veins of rock in place bearing gold or silver or other metal, to justify their designation as "known" veins or lodes. To meet that designation the *lodes or veins must be clearly ascertained,* and be of such extent as to render the land more valuable on that account, and justify exploitation.[15]

Following this early pronouncement by the Court there followed a series of rulings which have since been cited and quoted in nearly every discussion involving the discovery requirement. This series of cases established the rule that mere indications of valuable mineral, however strong, are insufficient[16] and that it is the *actual finding* of the mineral in rock in place, as distinguished from float rock, that constitutes the discovery.[17] Also, evidence which merely suggests a possibility that valuable mineral *may,* on subsequent exploration, be found to contain ore of great value has been held unacceptable.[18] The Supreme Court stated with some emphasis and considerable clarity in *King v. Amy Silversmith Mining Co.*:[19] "Locations resting simply on conjectural or imaginary existence of a vein or lode within their limits shall not be allowed. A location can rest only upon an *actual* discovery of a vein or lode."[20]

Thus the rule that only an actual physical exposure of valuable mineral within the limits of the claim would satisfy the discovery requirement.[21] This rule and its application to unexposed deposits based on surface indications and geological deductions has been summarized as follows:

> Title to the claims is sought essentially on account of their possible value for certain unexposed deposits supposed to exist a considerable depth beneath the surface, and hav-

14 128 U.S. 673 (1888).
15 *Id.* at 683 (Emphasis added).
16 Iron Silver Co. v. Mike & Starr Co., 143 U.S. 394 (1892).
17 Book v. Justice Mining Co., 58 Fed. 105 (D. Nev. 1893); Dalten v. Clark, 129 Cal. App. 136, 18 P.2d 752 (1933).
18 Chrisman v. Miller, note 11, *supra;* Iron Silver Co. v. Mike & Starr Co., note 16, *supra;* United States v. Mobley, 45 F. Supp. 407 (S.D. Cal. 1942).
19 152 U.S. 222 (1894).
20 *Id.* at 227 (Emphasis added).
21 2 Lindley, *Mines,* § 336 (3d ed. 1914); Miller v. Chrisman, 140 Cal. 440, 73 Pac. 1083 (1903); Whiting v. Stroup, 17 Wyo. 1, 95 Pac. 849 (1908).

> ing no connection, as far as shown, with any deposits appearing on the surface. The exposure, however, of substantially worthless deposits on the surface of a claim; the finding of mere surface indications of mineral within its limits; the discovery of valuable mineral deposits outside the claim; or deductions from established geological facts relating to it; one or all of which matters may reasonably give rise to a hope or belief, however strong it might be, that valuable mineral deposit exists within the claim, will neither suffice as a discovery thereon, nor be entitled to be accepted as the equivalent thereof.[22]

The Court, in the case of *Nevada Sierra Oil Co. v. Home Oil Co.*,[23] refused to accept the sufficiency of discovery evidence based on geological inferences and deductions and made the statement that since indications of a thing are not the thing itself, mere indications of a mineral cannot constitute a valid discovery.[24]

An excellent analysis and review of this entire point is given by Lindley in his work on the Law of Mines.[25]

II. STATE LAW DISCOVERY REQUIREMENTS

State laws governing the location and recording of mining claims on the public domain are a valid exercise of the regulatory authority permitted under the mining laws.[26] However, such laws are valid only to the extent that they are not inconsistent with the federal laws.[27] Therefore, while state law may impose additional burdens on the locator of a mining claim by way of requiring additional development or discovery work,[28] such laws cannot alter the minimum requirements of the federal law.[29]

III. RECENT COURT DECISIONS

It has been mentioned before that the purpose of the actual physical discovery requirement before a mining claim is validly located is to prevent the government from being defrauded. Another reason is to protect the prospector against wholesale segregation of mineral land by locators of spurious claims. It is because of this that the courts have refused to accept geological evidence as sufficient to satisfy the discovery requirement of the law. Such evidence has been viewed as merely indicative of the presence of mineral and as the Court stated in the *Nevada Sierra Oil Co.* case,[30] must be rejected since mere indications of mineral do not constitute discovery of the mineral itself.

The radioactive properties of uranium have made geophysical prospectors out of almost everyone who can get a Geiger counter or a scintillator. However, it would seem that such geophysical evidence of the presence of radioactive minerals is in no better position than strictly geological findings as proof of discovery under the

22 East Tintic Consolidated Claims, 40 L.D. 271, 274 (1911).
23 98 Fed. 673 (1899).
24 Cited in Whiting v. Stroup, note 21, *supra*.
25 See note 3, *supra*.
26 17 Stat. 92; 30 U.S.C. § 28 (1952).
27 Kendall v. San Juan Silver Mining Co., 144 U.S. 658 (1892).
28 Erhardt v. Boaro, 113 U.S. 527 (1885).
29 Northmore v. Simmons, 97 Fed. 386 (1899); Saxten v. Perry, 47 Colo. 263, 107 Pac. 281 (1910).
30 See note 23, *supra*.

mining laws. At least this would be a necessary conclusion from the judicial precedents recorded over the past 75 years. The several recent cases discussed below involving such evidence of discovery should, therefore, be of more than casual interest to persons interested or involved in mining law and especially to those interested in uranium claims.

The first of these cases, *Smaller v. Leach*,[31] was decided by the Colorado Supreme Court on October 14, 1957. Discovery was not an issue in the case but rather it dealt with the validity of a grubstake agreement based on loan of a scintillator for uranium prospecting.

In the decision, Justice Sutton, speaking for the court, attacked the practice being used by uranium prospectors wherein large areas were staked without compliance to the mining law in hopes that later legal discoveries would validate these claims. He concluded this "dicta" with the following comment on the absence of either state or federal legislation that would allow geophysical evidence as the basis for valid discoveries:

> This court recognizes that no Colorado nor Federal legislation has yet been enacted to expressly provide for the atomic era in radioactive mineral locating. No such laws exist expressly providing that valid discoveries can be made by radio detection devices, possibly because of the newness of the subject, or, because of fear of defective instrument, fraudulent claims, mistakes which may arise, the difficulty of determining on the ground as to whether a claim has been validated by discovery, or because not all radio-active areas are in fact valuable. It also appears that uranium itself at times may be "inbalance"; viz., not giving off any count or that count may be different than the chemical assay, which is the conclusive test.[32]

The Colorado Supreme Court in this decision indicated that it would not accept as valid a mineral discovery based on geophysical evidence but would treat such data as mere indications of mineral and not the mineral itself.

Shortly after the *Leach* case was decided, the Wyoming Supreme Court was confronted with the problem that the Colorado court had refered to in *Leach* but did not have to answer, *i.e.*, can there be a valid discovery of mineral based on geophysical data?

31 136 Colo. 297, 316 P.2d 1030 (1957).
32 *Id.* at 307, 316 P.2d at 1037.

That was the question before the Wyoming court in *Globe Mining Co. v. Anderson.*[33]

In that suit, Globe Mining Co. brought an action to quiet title to ten lode mining claims located on the public domain. Globe had discovered a highly radioactive anomaly by means of an airborne scintillator. The area containing this anomaly was then examined on foot, the geology determined, and a radioactive count of 2 to 7 times background obtained on all claims. Samples were taken from three of the claims and chemical assays of the samples disclosed uranium. Globe then performed the other location requirements and hired a person to do some work on the claims. Approximately two years later Anderson entered and located in the same area, overlapping some of the Globe claims.

The Wyoming Supreme Court, speaking through Justice Parker, held that Globe had valid claims on only the three claims from which the chemical assays had been taken, that on the remaining claims there was no valid discovery and Globe was not entitled to possession, and that Globe could not question Anderson's attempt to establish valid claims. As to the seven remaining claims there was no evidence of sampling or assaying of a "vein, lode, or rock in place" which prompted the court to say:

> Thus there was no evidence of a sampling and assaying of a vein, lode, or rock in place in Phil #3, 4, 7, 9, 10, 11, and 12, and, therefore, no discovery on those claims—unless we recognize the readings of electrical instruments such as scintillators and Geiger counters as sufficient to support discovery. This we are reluctant to do, since such counters while helpful in prospecting for uranium cannot be relied on as the *only test.* For instance the plaintiffs' witness Grant, testifying about his general investigation of the subject, said that in certain areas where the background count was high an assay showed no uranium. To the same effect see Ninninger, Minerals for Atomic Energy, 2d ed. pp. 37 and 73. Thus with the exception of Phil #5, 6, 8 there is no evidence in the record on which to base discovery of a vein, lode, or mineral bearing rock in place within the limit of any Phil claim. This is required by both the Federal and the Wyoming statute relating to lode claims, and the plaintiff is obligated to sustain the burden of proof in that respect.[34]

The Wyoming court thus concluded that geophysical evidence in the form of favorable radiometric showings does not *alone* suffice to comply with the statutory requirement that "mining claims upon veins or lodes of quartz or other rock in placebearing . . . valuable deposits" cannot be validly located "until discovery of the vein or lode within the limits of the claim is located." The court's statement that scintillator or Geiger counter readings cannot be relied on as the "only test" is significant, however, in that it indicates that although such geophysical evidence "alone" is insufficient basis for a valid discovery of mineral perhaps such evidence when accompanied by other "indications" would be sufficient to meet the require-

33 78 Wyo. 17, 318 P.2d 373 (1957).
34 318 P.2d at 380.

ment. Just what the court might require in addition to the geophysical information is not indicated.

Rummell v. Bailey,[35] decided by the Supreme Court of Utah, was the first case to deviate from the position taken in the *Leach* and *Globe* cases. There the court held that a discovery based on a reaction from a Geiger counter, plus geological analysis of the immediate area as well as the nature of nearby proven ore bodies was valid. This was the first example of what a court might accept, in addition to geophysical data, as reasonable evidence of a discovery.

From the comment of Justice Sutton in the *Leach* case it would seem that the Colorado court felt that before geophysical evidence could be accepted as satisfying the discovery requirement of the mining law, new legislation would have to be passed permitting it. For this reason the opinion of the Colorado court in *Dallas v. Fitzsimmons*,[36] decided some six months after *Leach*, was surprising.

The *Dallas* case involved three uranium claims located on state land that was open to lease. Discovery on the claims was based on Geiger counter readings from each claim and a chemical assay from one of them. Dallas tried to buy the claims from Fitzsimmons, the locator, and when Fitzsimmons refused to sell, Dallas leased the land from the state and brought an action to eject Fitzsimmons as a trespasser on the leased land. Fitzsimmons claimed a right to the land because of valid lode claims and the trial court held for him. This was affirmed by the Colorado Supreme Court.

First, it should be mentioned that the fact that the land involved was state land rather than federal public domain does not alter the importance of this case to mining law in general. This is true because of the jurisdiction resting in state courts to determine the right to possession in controversies between rival mineral claimants, and the similarity between the state and federal requirements. This is especially true here since the court relied entirely on judicial precedent which involved the public lands mining laws, and has not indicated that its decision is predicated on any distinction between the discovery requirements of the state and federal mining laws.

The court summarized the discovery evidence upon which the three claims were based as follows:

> There is evidence that *uranium was found on each claim by use of the Geiger counter.* Assays of the claim samples from *one of the discovery pits* showed chemical results up to 1.24% uranium and 0.4% vanadium according to testimony objected to but not ruled on below.
>
> The record and briefs carefully and ably detail the lengthy history of just how *defendants made this discovery with a Geiger counter and later had samples from one of the claims chemically assayed.* The assays proved what the Geiger counter indicated on the ground, *i.e.*, mineralization sufficient to constitute a "discovery" within the meaning of our statute.[37]

The court in justifying its conclusion that the chemical assay

35 7 Utah 2d 137, 320 P.2d 653 (1958).
36 137 Colo. 196, 323 P.2d 274 (1958).
37 *Id.* at 202, 203, 323 P.2d at 278 (Emphasis added).

from the one claim, plus the Geiger counter readings from the adjoining claims was enough to satisfy the discovery requirement for each claim said:

> Where as here the assay of samples from at least one of the claims, and all the claims are contiguous, and where the trial court could and did conclude from the evidence that the non-assayed claims lie on similar ground, it is not unrealistic to hold that competent radiometric reactions, supported by a chemical assay as to part of the claims, clearly show the presence of uranium on the adjacent claimed location showing the same or similar radiometric readings. *The latter are then valid "discoveries" under our statute as much as are outcrops visible to the naked eye.* Such other "discoveries," however, must be capable of competent radiometric delineation in similar rock in place or along the same vein or lode. See *Smaller v. Leach,* 136 Colo. 297, 313 P. 2d 1030, for a discussion of radiometric discoveries; and compare *Rummell v. Bailey,* 1958, 7 Utah 2d 137, 320 P. 2d 653, and *Globe Mining Co. v. Anderson,* Wyo. 318 P. 2d 373.
>
> Keeping in mind that technical prospecting methods, such as the use of counters and scintillators, are only exploration tools and not complete exploration and discovery systems, we hold that here radiometric results coupled with the other evidence, such as assay and type of rock in place show an overall fair compliance with the statute requiring discovery.[38]

Justice Hall, in his dissent to the *Dallas* opinion disputes the majority belief that this conclusion is not "unrealistic." The dissent expresses the belief that the majority opinion is revolutionary in the result it reaches as far as the discovery requirement of the mining law is concerned. In his dissent Justice Hall said:

> I respectfully submit that a Geiger counter, no matter what its reading may be, does not prove mineral in place. Without discovery of *mineralized rock in place* there can be no valid location of a lode claim, no matter what the Geiger counter readings may be.
>
> The effect of the majority opinion is to substitute for *proof of a discovery of mineral in place* a mere possibility,

38 *Id.* at 204, 323 P.2d at 279 (Emphasis added).

> probability or conjecture of mineral in place, and thus judicially legislate that there need not be an actual and proven discovery to have a valid claim.
>
> The legal effect of the decision is to authorize unlimited filings based on one actual legal discovery. If such a result is desirable then it is a matter for the legislature and not for the courts.[39]

A short time after the *Dallas* decision was rendered the Nevada Supreme Court reached a similar result in the case of *Berto v. Wilson.*[40] The Nevada court held that the use of a scintillator and a mineral light on outcrop samples plus the prior mining and prospecting experience of the locator was sufficient to meet the discovery requirements.

In the *Globe* case the Wyoming court intimated that although geophysical data "alone" would not be accepted as proof of "valid discovery," geophysical data plus something else might be accepted. That this thought was in the mind of the Wyoming court is evidenced by its decision in the *Western Standard* case,[41] decided in 1960, three years after *Globe.*

The facts in *Western Standard* are as follows: On June 30, 1954, Thurston's predecessors in interest located and staked claims XYZ #1-13 in the Gas Hills of Wyoming. The claims were located on a trend discovered by considering the geology of the area and by chemically assaying numerous samples taken from *adjoining* and *adjacent* claims. At or shortly after location, discovery pits were dug on all claims. Radiometric readings were taken in each pit and each produced readings of 2-4 times background. Between June 26 and July 2, 1957, a drill hole was completed on each claim.[42] Each hole was probed with a radiometric device which recorded emissions of rays from uranium ores. Samples of the cuttings of each hole were taken but were not chemically assayed until after the present case came to trial. Thurston's predecessors in interest maintained possession of the claims from the time of location until October 9 or 10, 1957, when agents of Western Standard Uranium Co. entered thereon, posted location notices and commenced work, claiming that the location of Thurston was void because of failure to comply with Wyoming and Federal discovery statutes. Thurston then brought a quiet title action which was decided in his favor in both the trial court and the Wyoming Supreme Court.

Western Standard claimed on appeal that the facts were insufficient to sustain a finding of discovery and that the trial court must have based its finding or discovery on radiometric readings and conjecture. As authority for this contention Western Standard Uranium Co. relied on the *Globe* case. The Wyoming Supreme Court rejected this and distinguished this case from *Globe* in the following manner:

> There is no reason to conclude that the trial court based its findings upon *any particular one* of these evidentiary facts nor is there any reason to believe that the court

39 *Id.* at 207, 323 P.2d at 280 (Emphasis added).
40 See note 1, *supra.*
41 Western Standard Uranium Co. v. Thurston, 355 P.2d 377 (Wyo. 1960).
42 Drill holes were completed after passage of the Wyoming Drill Hole Law and were apparently a precautionary measure on the part of Thurston's predecessors. See Wyo. Stats. § 30-6 (1957).

> should or did ignore the many combined pertinent facts and factors which were disclosed by the plaintiff's showing on the motion for summary judgment and which definitely, on the facts herein, distinguishes this case from the *Globe* case.[43]

The court further explains in language that should earn for it a warm spot forever in the hearts of geologists and geophysicists, the reasoning behind its decision when it says:

> It may be conceded that a discovery could not be based on any *one* of the above facts but they are all relevant facts which should be considered as component parts of an assemblage of physical facts which might and would "justify a reasonably prudent man in expending money and effort in further exploration or development." For this court to rule otherwise would require it to adopt a position that a man or men engaging in a specialized business can never be a reasonably prudent man unless their methods and operations follow the court's concept of the proper manner of conducting their business and substituting the judgment of the court for experts in their respective fields.[44]

The court after referring to other cases that have treated this same problem continues by saying:

> While no case examined allows the predicating of a discovery solely on radiometric readings, the importance of such readings, when taken into consideration with other facts and factors, is universally recognized. To fail to do so is to deny progress or recognize that scientific tools by continued use and experience can and usually do evolve from unreliability to respected accuracy when properly applied to their ultimate uses.[45]

The result of this case is to declare valid claims in which there was, at the time of location, no "actual discovery of mineral in rock in place." There had been no chemical assays, until much later, to show mineral content within the boundaries of the claims. The entire discovery was based on what previously had been held to be mere indications of mineral. Discovery evidence here consisted of a trend discovered by application of geological theory and assays taken from nearby claims known to contain uranium, Geiger counter readings from discovery pits on each claim, and the fact that the discovery pits exposed a geological formation known to be the only uranium bearing formation in the area. Radiometric well logs taken some time after location and chemical assays of samples taken from drill holes, which were not assayed until after the case had gone to trial, were used by the court only as additional proof of what the original discovery had already proven.

This case may well become a landmark case in the area of the discovery requirement in mining law. It stands for the proposition that geophysical evidences of minerals are no longer to be considered as "mere indications" of mineral but can, when accompanied by other indications of mineral that substantiate the conclusions derived from the geophysical evidence, be treated as equal to a

43 *Id.* at 382 (Emphasis added).
44 *Id.* at 382.
45 *Id.* at 382.

finding of mineral in place in a vein or lode and thus be the basis for a valid mineral discovery as required by state and federal statutes.

IV. Conclusion

No longer is it absolutely essential to have an actual discovery of mineral in place in a vein or lode in order to have a valid location. At least this is true for location of lode claims for radioactive minerals. A chronological examination of the cases treated here shows this to be true. In *Smaller v. Leach*,[46] decided in 1957, the Colorado court in some dicta in its opinion outlined the general rule that mere indications cannot form the basis of a valid discovery of mineral but rather there must be an actual discovery of mineral in a vein or lode of rock in place. The court also stated in this dicta that if this policy were to be changed, and the court indicated that it felt it would have to be changed before geophysical evidence could be used as a basis for a discovery, it would be for the legislature to change and not the courts.

Later in 1957, the Wyoming Supreme Court, in its *Globe Mining*[47] decision, followed the general rule by refusing to allow claims to stand in which there had been no actual discovery of mineral. The court gave an indication of what was to come, however, when it emphasized in its opinion that it would not accept as valid a discovery in which geophysical data was the "only test" and that geophysical data "alone" was not sufficient to support discovery.

Modification of the general rule requiring actual discovery of mineral before there was valid discovery occurred when the Colorado Supreme Court, in a decision that Justice Hall in his dissent calls revolutionary, decided the *Dallas* case[48] early in 1958. In that case the court apparently forgot the belief it expressed earlier in *Smaller v. Leach*,[49] that the job of changing the discovery requirement so as to permit the use of geophysical data belonged to the legislature and did a bit of legislating on its own. The court most certainly was influenced by the Wyoming and Utah courts as the opinion refers to both the *Globe* and *Rummell* decisions.[50] The court in effect agreed with the *Globe* case and held that geophysical evidence *alone* is not enough to establish a valid discovery, but geophysical evidence *plus* something else is enough. The Colorado court said that "something else" must be a valid physical discovery of mineral in place on at least one of the claims in question and that the other claims from which no assays are obtained must be in similar rock or along the same vein or lode as the one from which the assay has been obtained. The court concluded that with that combination of facts it is not unrealistic to hold there is compliance with the discovery statutes.[51]

The final step in this transition was taken by Wyoming in the *Western Standard* case.[52] That decision was the "coup de grace" of

46 See note 31, *supra*.
47 See note 33, *supra*.
48 See note 36, *supra*.
49 See note 31, *supra*.
50 See note 38, *supra*.
51 See note 38, *supra*.
52 See note 41, *supra*.

the long adhered to and staunchly defended rule that where there is no actual mineral present there is no discovery and its counterpart that the indications of a thing no matter how strong are not the thing itself and thus mere indications of mineral cannot constitute a valid discovery.

In *Western Standard* the court went one step further than the Colorado court had gone in *Dallas*. *Dallas* held that there had to be at least one actual discovery of mineral in place, at least one of the claims in question had to have a chemical assay showing mineral, which the Colorado court had earlier stated was the conclusive test. But *Western Standard* declared valid thirteen claims none of which had had an assay made on a sample until well after the case had gone to trial and then the court, in overruling a motion not to allow entry of such assays as evidence, said that such assays only corroborated the earlier discovery. The earlier discovery was based entirely on evidence that would, under the rule of *Nevada Sierra Oil Co. v. Home Oil Co.*[53] and other similar cases, have been classified as "mere indications." The discovery relied on in *Western Standard* and declared valid by the Wyoming court was based on Geiger counter readings, geological deductions, assays from neighboring claims of proven worth, the fact that the geological formation cut by the discovery pits was known to be the only uranium bearing formation in the area, and customs or practice of the miners in the area.

The result of this case is a very practical one. The courts still will not accept as valid discovery based entirely on geophysical evidence. It is felt that not even the mining people would advocate such a ruling as they, much more than the lawyers and judges, are aware of the failings and shortcomings of these technical devices. But, at the same time, information obtained by the use of such instruments, which have over the years proven themselves to be accurate the great majority of the time, should not be completely ignored when corroborated by additional facts and indications. The result of this case will allow such information to be used to prove discovery.

Mining law has been criticized as outmoded and in need of reform.[54] It is contended that because of obsolete laws the mining industry is prevented from fully utilizing modern technological advancements. The modification of the mining law, resulting from the decisions in these several recent cases should aid in removing some of those obstructions, at least as regards discovery based on geophysical data. It is felt that the *Western Standard* case will become a landmark case in this area and provides an excellent indication of what it takes to establish a valid discovery of mineral when the main evidence of such discovery is geophysical information. This modification of the mining law should result in greater reliance on geophysical and other scientific methods of discovery, greater confidence in the legal validity of resulting discoveries, and thus a greater benefit to the mineral industry and the country.

53 See note 23, *supra*.

54 Martz, *Pick and Shovel Mining Law in an Atomic Age: A Case for Reform*, 27 Rocky Mt. L. Rev. 375 (1955).